REMARKS

Amendments

The preamble of claim 1 is amended to recite "a method of processing a substrate for use ..." In addition, the substrate is said to have a surface and a layer applied thereon, to clearly define the configuration of the substrate and the layer. Further, claim 1 is amended to recite that the edge region is disposed at the perimeter edge of the substrate. See, Figs. 1 to 4.

Claim 8 is amended to recite that the edge region is removed completely, as disclosed, for example, at page 7, line 1, and that, based on the optically scanning (an edge region or a test field), a parameter of the laser beam is adapted or regulated such that the edge region is completely removed. See, e.g., the bottom of page 6 and the text bridging pages 14-15.

Claim 9 is amended to recite that the aperture means is not transparent to the laser beam. See, e.g., page 11, line 33 of the specification.

Claims 4, 5, 10, 11, 15, 16, 18, 19, 20, and 21 are amended merely to make corrections in grammar and to clarify the language thereof.

New method claims 30 to 37 recite that the edge region to be removed extends along the entire circumference of the substrate. See, e.g., Figs. 1 to 4. New claims 38-43 relate to removal of a thickened edge region. See, e.g., the text bridging pages 1-2, and the Figures.

Rejection under 35 USC 102(b)

Claims 1-4, 6-10, 24, 26 and 28-29 are rejected as allegedly being anticipated by Rizvi et al. in view of Knowles et al. and Lumonics. Applicants respectfully traverse this rejection.

In the rejection it is asserted that Rizvi et al. "anticipate" removal of an edge region of a layer. In support of this assertion, the rejection refers to Figure 1a of Rizvi et al. However, Figure 1a of Rizvi et al. does not describe removal of an edge region of a layer.

Figure 1a illustrates laser ablation of a material wherein exposure to an excimer laser results in the breaking of molecular bonds and the ejection of small amounts of material. Further it is stated that "for a polymer material such as a polyimide, ablation to a depth of 10 μm can be achieved in with ~30-100 shots."

In the description of Figure 1a, no mention is made of a substrate having a layer in which the layer has an edge region at the perimeter thereof. Nor is there any mention or

suggestion of removing such an edge region form the perimeter of a layer disposed on a substrate.

Rizvi et al. is directed to the manufacturing of special bio-chips using thin film technology. As can be seen from, for example, Fig. 4, such bio-chips consist primarily of linear tracks, traps and analysers embedded in a substrate. The bio-chip is formed by excimer laser mask projection techniques. See, e.g., the abstract.

As described at page 4, left column, the device is said to be made up of thin metal films and insulating polymer layers. According to one procedure describe at page 4, left column, a gold layer (~100nm) is laser-patterned using mask scanning to produce 10 μm wide electrodes. Then, via holes are drilled through an insulating polyimide layer using a laser (see Figure 5, and the text at page 4, right column, lines 14-19). No mention or suggestion is made regarding removing an edge region form the perimeter of a layer.

According to another procedure, the gold layer is coated with a photoresist. The photoresist is then patterned using laser mask scanning. This leaves an exposed pattern of underlying gold which can then be removed by a laser. No mention or suggestion is made regarding removing an edge region form the perimeter of a layer.

As mentioned, once the gold electrodes are formed, a layer of polyimide is applied and via holes are drilled through the polyimide layer. See the text at page 4, right column, lines 14-19. Thereafter, the device is coated with gold and then electrical bus bars are formed by laser ablation and a channel is machined into the polyimide. The device is then sealed by an insulator. See also Figure 6 which schematically illustrates this process. Here again, no mention or suggestion is made regarding removing an edge region form the perimeter of a layer.

Rizvi et al. only teach removal of masked/unmasked patterned areas on a substrate. Such masked/unmasked patterned areas are, however, disposed only at central portions of the substrate, not at an edge region at the perimeter of a substrate or of a layer on a substrate.

It is noted that removal of a perimeter edge region would by contrary to the intended functionality of the bio-chips disclosed by Rizvi et al. If the trenches or electrode structures were formed at the edge region of the chip, it would not be possible to clearly define edge regions of such trenches or electrode structures. Even worse, such trenches would not be leak-tight, which would be detrimental to the function of such bio-chips.

The article by Knowles et al. is cited in the rejection to support the assertion that

ablation involves evaporation. The brochure by Lumonics is cited in the rejection to support the assertion that the excimer laser of Rizvi et al. has an average power in the 10-100 Watt range. Neither of these secondary describes or suggests removal of an edge region from the perimeter of a layer on a substrate by means of a laser.

Thus, none of the references cited in the rejection disclose or suggest removal of an edge region at the perimeter of a layer applied to a substrate by means of a laser.

Additionally, the assertion that Rizvi et al. teaches that the laser beam is incident on the plane spanned by the substrate, as recited in applicants' claim 4, is incorrect. According to Rizvi et al., the laser beam is incident from above the substrate. Otherwise, trenches and holes could not be formed in the photoresist or polyimide layers using laser ablation. If the laser beam would be incident on the layer in a tangential manner, it would simply burn a hole into the entire photoresist layer, which would then probably form an undesired trench.

Similarly, Rizvi et al. do not teach the optically scanning of a region, be it an edge region or a central region, in order to adapt or regulate the removal of the region. Compare applicants' claim 8.

In view of the above remarks, it is respectfully submitted that Rizvi et al. fails to describe, in accordance with 35 USC §102, each and every feature of applicants' claimed invention. Withdrawal of the rejection under 35 USC §102(b) is respectfully requested.

Rejection under 35 USC 103(a)

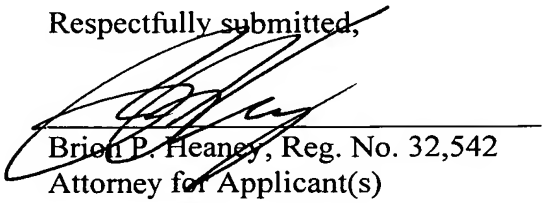
Claim 5 is rejected as allegedly being obvious in view of Rizvi et al., Knowles et al. and Lumonics, and further in view of Quentel et al. Applicants also respectfully traverse this rejection.

The rejection argues that Quentel et al. disclose reducing particle re-deposition by means of a blower. However, as noted above, none of Rizvi et al., Knowles et al. and Lumonics disclose or suggest removal, by means of a laser, of an edge region at the perimeter of a layer applied to a substrate. The disclosure of Quentel et al. does not overcome this deficiency in the references relied on in the anticipation rejection.

In view of the above remarks, it is respectfully submitted that Rizvi et al., taken alone or in combination with Knowles et al., Lumonics, and/or Quentel et al. fails to render obvious applicants' claimed invention. Withdrawal of the rejection under 35 USC §103(a) is respectfully requested.

The Commissioner is hereby authorized to charge any fees associated with this response or credit any overpayment to Deposit Account No. 13-3402.

Respectfully submitted,



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